	Application No.	Applicant(s)	
Notice of Allowability	10/792,292	FUJII ET AL.	
	Examiner	Art Unit	
	Adrian L. Kennedy	2121	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to <u>29 November 2006</u>.

2. ☒ The allowed claim(s) is/are <u>11-13</u>.

3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All   b) ☐ Some*   c) ☐ None of the:

        1. ☒ Certified copies of the priority documents have been received.

        2. ☐ Certified copies of the priority documents have been received in Application No. _____ .

        3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

    * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.

    (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached

        1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____ .

    (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____ .

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)

2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)

3. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date <u>11/29/06</u>

4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material

5. ☐ Notice of Informal Patent Application

6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .

7. ☐ Examiner's Amendment/Comment

8. ☒ Examiner's Statement of Reasons for Allowance

9. ☐ Other _____ .

Examiner's Detailed Office Action

1.   This Office Action is response to Amendment After Non-Final Rejection filed November

29, 2006.

2.   **Claims 1-52** were originally presented.

3.   **Claims 1-10 and 14-52** were cancelled.

4.   **Claims 1, 15, 20 and 41** were amended.

5.   **Claims 11-13** will be examined.

Allowable Subject Matter

Claims 11-13 allowed.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 11,

The disclosure of Wu et al. (*Fuzzy Control of Rider-Motorcycle System Using Genetic

Algorithm and Auto-Tuning*) teaches the fuzzy control of a motorcycle using optimization

(*Wu et al.*; Page 441; "*fuzzy control with both genetic algorithm (GA) and an auto-tuning*

method is proposed to improve the performance of fuzzy control that represents rider

behavior"). Including the use of a number of input and output variables (P 443; "*input*

and output variables") and a fuzzy model (P 441; "*model*").

The disclosure of Ulyanov et al. (USPubN 2004/0030420) teaches the optimization of a

teaching signal using a fuzzy controller (Paragraph 0011; "*the teaching signal can be*

approximated online by a fuzzy controller that operates using knowledge from the

knowledge base").

The previously cited disclosure of Shanahan (USPubN 2003/0078899) teaches the

optimization (P 0146; "*Powell minimization*") of linguistic variables (P 0044; "*linguistic*

variable"), and the use of a knowledge base that contains fuzzy rules (P 0046;

"*knowledge bass 122 contains fuzzy rules*").

Additionally the newly discovered reference Satyadas et al. (*GA-optimized Fuzzy*

Controller for Spacecraft Attitude Control) teaches the optimization of linguistic

variables (Page 1982, Right Column, Paragraph 1; "*GA-optimized membership function*

parameters" and Page 1980, Left Column, Paragraph 4; "*there is a membership function*

associated with every linguistic variable") used for fuzzy control (Page 1979, Left

Column, Paragraph 4; "*Fuzzy Logic and Genetic Algorithms that will provide robust non-*

linear control").

The examiner asserts that it would have been obvious to one skilled in the art at the time

of invention to combine the teachings of Wu et al. (*Fuzzy Control of Rider-Motorcycle*

System Using Genetic Algorithm and Auto-Tuning) with the teaching of Ulyanov et al.

(USPubN 2004/0030420) for the purpose of facilitating the operation of a rule-based

fuzzy control system (Wu et al; Page 442; "*fuzzy controller includes control rules*") that

optimizes control (Ulyanov et al.; Paragraph 0012; "*minimizes entropy production*")

using a teaching signal (Ulyanov et al.; P 0010; "*a teaching signal that provides good*

control qualities for a controller"). However, neither Wu et al. nor Ulyanov et al.

suggest the use of optimized linguistic variables.

Shanahan teaches the optimization of linguistic variables, but it would no have been

obvious to one skilled in the art at the time of invention to combine the inventions of Wu

et al. and Ulyanov et al. with Shanahan. However, it would have been obvious to on skilled in that art to combine the teachings of Wu et al. and Ulyanov et al. with the teachings of Satyadas et al.

It would have been obvious to one skilled in the art at the time of invention to combine the teachings of Wu et al., Ulyanov et al. and Satyadas et al. for the purpose of facilitating the operation of a rule based fuzzy control system (Wu et al; Page 442; "*fuzzy controller includes control rules*") that optimizes control (Ulyanov et al.; Paragraph 0012; "*minimizes entropy production*") using a teaching signal (Ulyanov et al.; P 0010; "*a teaching signal that provides good control qualities for a controller*") and optimized membership functions associated with linguistic variables (Page 1982, Right Column, Paragraph 1; "*GA-optimized membership function parameters*" and Page 1980, Left Column, Paragraph 4; "*there is a membership function associated with every linguistic variable*").

However, no prior art of record, either alone or in combination suggest the ranking or eliminating of rules according to firing strength or the elimination of rules with weak firing strength.

Based on the previously set forth arguments, the examiner has found that based on the prior art of record, the currently pending claims 11-13 are allowable as not being anticipated by the prior art.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Wu et al. (*Mechatronics Vol. 5*) is cited for his method of fuzzy control of a rider-motor cycle system using a genetic algorithm. Ulyanov et al. (USPN 2004/0030420) is cited for his system and method for nonlinear dynamic control based on soft computing with discrete constraints. Satyadas (IEEE) is cited for his genetic algorithm optimized fuzzy controller for spacecraft attitude control. Shanahan (USPubN 2003/0078899) is cited for his fuzzy text categorizer. Kaji et al (USPN 6,735,576) is cited for his method or real-time optimization of control device equipped with fuzzy inference system. Sepe, Jr. et al. (USPN 6,711,556) is cited for his fuzzy logic controller optimization. Pappalardo et al. (USPubN 2002/0099673) is cited for his coding and memorizing method for fuzzy logic membership functions and corresponding method and circuit architecture for calculating the membership degree. Furuta et al. (USPN 5,349,646) is cited for his signal processing apparatus having at least one neural network. Ulyanov et al. (USPubN 2004/00247500) is cited for his intelligent mechatronic control of a suspension system based on quantum soft computing. Ulyanov et al. (USPubN 2002/0016665 and USPN 6,721,718) is cited for his system for intelligent control of an engine based on soft computing. Ulyanov (USPN 6,411,944) is cited for his self-organizing control system. Ulyanov et al. (USPN 6,463,371) is cited for his system for intelligent control of a vehicle suspension based on soft computing. Ulyanov et al. (USPN 6,496,761) is cited for his optimization control method for a shock absorber.

Any inquiry concerning this communication or earlier communications from the examiner

should be directed to Adrian L. Kennedy whose telephone number is (571) 270-1505. The

examiner can normally be reached on Mon -Fri 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor,

Anthony Knight can be reached on (571) 272-3687. The fax phone number for the organization

where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application

Information Retrieval (PAIR) system. Status information for published applications may be

obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ALK

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